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ABSTRACT

This review of journal literature proposes that ethnic/race-specific research on cognitive/learning styles provides models for cross-cultural and multicultural classrooms that will maximize learning through building self-esteem and devoloping a reason for learning. The intent of the review was to discover patterns and themes developing across cultures and across studies. Highlights of journal articles are provided in table format; an index to citations follows the table. The aspects and findings are categorized to develop a taxonomy of aspects and learner orientations. The taxonomy provides topical groupings that facilitate further identification of cross-cultural aspects and implications for maximizing learning for all students. The focus is on how the background factors that students bring to school can be matched by school policies suitable for a variety of students. (JD)

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MAXIMIZING LEARNING FOR ALL STUDENTS: A REVIEW OF LITERATURE ON LEARNING MODALITIES, COGNITIVE STYLES AND APPROACHES TO MEETING THE NEEDS OF DIVERSE LEARNERS

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Maximizing Learning for All Students: A Review of Literature on Learning Modalities, Cognitive Styles and the Approaches to Meeting the Needs of Diverse Learners

In recent years, the research of cognitive neuro-scientists into brain processing, brain growth, and brain dominance has led educators to take another look at traditional instructional methods. In addition, learning-styles researchers have added to understandings of how heredity, experiences, environment, and cultural differences affect learning. According to Lesser (1976, p. 37), "people who share a common cultural background will also share, to a certain extent, common patterns of intellectual abilities, thinking styles and interests."

Previously, little specific information about how to maximize learning for diverse student populations had been documented. For example, Laosa (1977) pointed out that "childhood socialization practices that are characteristic of certain cultures tend to foster the development of particular cognitive styles" (p. 28), but gave only a few examples contrasting Mexican-American and Anglo-American children. One would need to research other descriptors and titles (such as learning styles) to find specific information on teaching diverse children.

The database for this review comes from journal articles (see Appendix A). It was obtained by way of a computer search of ERIC on Silver Platter for the years 1980-1988. Key descriptors were "cognitive style," "learning strategies," "learning modalities," and specific descriptors categorized under "ethnic groups" and "culture." Other studies were located by searching the references cited in these articles. The articles that were discovered in this search were all identified in the reference list, even if they were not included in the tabled categorization. A list of references by author (see Appendix B) was organized for easy access to specific researcher's studies.

A taxonomy was developed to provide topical groupings that facilitate further identification of cross-cultural aspects and implications for maximizing learning for all students (see Appendix C).

Learners at Risk

Students who are labeled "different" by virtue of race, language or linguistic diversity, sex, income status, handicap or learning difficulty or any student for whom education is an obstacle are learners at risk. The 1985 report Barriers to Excellence: Our Children at Risk cited the role of schools as central institutions in the ongoing effort to reverse the effects of economic deprivation and racial and cultural discrimination.

The rising number of school dropouts is the single most dramatic indicator of the degree to which schools are failing children. While the overall national dropout rate is 30 percent,

the rates for Blacks and Hispanics are higher than 50 percent in many urban school districts (Haberman, 1989). The degree of failure is even more dramatic and disturbing for specific populations. The Oklahoma State Department of Education 1984-85 Dropout Rate identified 45.7 percent of the female American Indian students and 54.3 percent of the male Indian students in that school year as dropouts (Oklahoma Department of Vocational and Technical Education, Summary Statistics: 1984-85 Final Dropout Report). By failing to educate such large numbers of students, schools actively help to perpetuate disadvantage and contribute to multi-generational cycles of poverty.

For Native Americans, the future is equally as bleak at rural reservation schools. Currently, at the Pine Ridge Oglala Community School, 50 percent of students between the ninth and tenth grades dropout. Only 25 percent of the freshman class will graduate. The overall student dropout rate and the overall adult unemployment rate are both about 85 percent at Pine Ridge (Sack, Beiser, Clarke & Redshirt, 1987). Bird (1984), Chairperson of the New Mexico Tribal Education Committee, reported: "At the University of New Mexico, the dropout rate for American Indian undergraduate students enrolled in the University College is an alarming 72 percent." Most of the Indian students attending the University of New Mexico, like those attending other colleges and universities in the State of New Mexico, graduated from public schools.

To achieve in public high school, students who are non-White, non-middle class, or non-mainstream must learn the appropriate middle-class behaviors and adopt the appropriate middle-class values. Those who do not must find a way to reconcile the values and/or behaviors of their subcultures with those of the mainstream culture (Luetgart, 1977). Those who cannot often dropout.

Teaching in a Multicultural Society

"In a sense, every classroom in the country is crowded because each child brings not only himself but also his friends, his family, his community, and the culture into which he has been born and is being raised" (Gold, Grant & Rivlin, 1977, p. 6). It is the reaction to these individual differences, not the differences themselves, that create social conflict; just as it is true that it is the reaction to different learning styles, not the differences themselves, that create classroom conflict in the form of discipline problems, low achievement, failure and dropping out. The schools in this country can no longer afford to cast themselves as the guardians of the status quo, of some idealistic view of mainstream America that ignores the diverse input of so many streams, tributaries, and wells -- America is a multicultural society.

Research suggests that people who share a common cultural background will also share common patterns of intellectual abilities, thinking styles and interests; ethnic groups,

independent of socioeconomic status, display characteristic patterns of thinking styles that are different from others (Gardner, 1983; More, 1987; Dunn & Griggs, 1988). While these cognitive or learning styles are not consistent enough to codify, they suggest distinct differences to be acknowledged in a learning environment.

Teachers and administrators should recognize that students bring a variety of learning, cognitive, and motivational styles to the classroom, and that while certain characteristics are associated with specific ethnic and social-class groups, these characteristics are distributed throughout the total student population. This means that teachers should use a variety of teaching styles and content that will address the needs of diverse students. Concepts should be taught, when possible, through different strategies so that students who are relational in their learning styles, as well as those who are analytic will have an equal opportunity to learn.

The Significance of this Review

The purpose of this research was to review the literature on ethnic/minority learning modalities and cognitive styles in an attempt to draw conclusions from the individual findings to develop a cross-cultural frame of reference to support more effective learning situations for <u>all</u> students, regardless of race, ethnicity, gender, language, SES, and family structure. Grant and Sleeter (1986) have presented the same argument in their review of multicultural education in this country.

Initially, some points need to be raised about the body of accumulating research. Of the nearly one hundred studies involving American Indians/Native Americans reported in this review, nearly one-third were based on studies of the Navajo people, "Dine". While it is obvious that the size of the Navajo Nation warrants this emphasis, the research findings themselves become skewed toward generalizations that are not truly applicable to all American Indian people. The differences disclosed in these research findings will perhaps do much to finally dispel the myth that the native people of North America are all the same, a stereotype similarly being confronted by those involved with peoples of Central and South America:

> Mexican Americans, mainland Puerto Ricans, Americans of Cuban descent, Americans of South American origin, as well as the recent immigrants from troubled Central American nations are distinct populations. They differ in demography and history, face different issues in schools, and should, therefore, be understood as such (Suarez-Orozco, 1987, p. 287).

The authors echo Suarez-Orozco's (1987) conclusion: "We need more comprehensive comparative studies exploring the different <u>kinds</u> of school problems facing different kinds of

minority populations" (p. 298). A comparison of the research reveals the differences between peoples grouped under the same minority heading. The stereotype that has been promulgated against Native Americans for so long has now been visited upon Central Americans and South Americans as well. Diversity within ethnic groups has received insufficient attention.

The review is nearly barren of research on more recent immigrant peoples (see "Vietnamese-Americans," Anderson, 1988; "Central Americans," Ogbu, 1987) even though Suarez-Orozco (1987) carefully presented the reasons for exploring the issues facing America's Hispanic immigrants from Central America.

Lack of knowledge about and understanding of different ethnic groups' learning modalities, cognitive styles, and cultural hertiage is being addressed by such programs as David Leonard's Cal Poly Multicultural Teacher Education Project and the research of Gloria Ladson-Billings (1989). The information needs to be presented to educators to avert the perpetration of Euro-centric views and interpretations.

One conclusion, clearly recommended by the findings, is that many minority students think holistically, thereby benefitting from whole language approaches to literacy. Strengthening this is the finding that many students of non-western heritage have developed imagery coding over semantics coding. One issue this should clearly impact on is the decision to employ whole language, literature-based reading, or basal readers in the curriculum.

The simultaneous/sequential research findings reveal a serious mismatch between learning styles of Native American students, African-American students, low-income white students and the usual teaching style of beginning reading. Many reading programs emphasize phonetics and the sounding-out approach; the strength of many of these students seems to be in simultaneous processing, suggesting whole language and sight-word vocabulary building.

The traditional utilitarian approach of American schools (Cuban, 1984; Illich, 1972; Freire, 1970, 1973; Jackson, 1968) has been repeatedly questioned by critical theorists and reform movements beyond those dealing specifically with culture and the learning process. The traditional holistic approach to learning that pervades Native American culture conflicts with the utilitarian education commonly experienced in Euro-American schools.

Native cultures stress avoidance of competition, a high level of cooperation, and strong peer influence. Native American and Spanish cultures both include a tradition of loyalty to the peer group and an emphasis on interpersonal cooperation rather than competition. Students who hold these cultural values tend to view displays of knowledge in the classroom as one person gaining at the expense of others. Since approval from the peer group is more important to them than approval from the instructor, such students will refrain from voluntary classroom discussion. Class participation is incompatible with their

cultural values.

Culturally specific compatibilities contribute to educational effectiveness; cultural incompatibility is one credible explanation for school failure. Elements found effective for Native Hawaiian children are not culturally compatible or effective for Navajo children. The same is true for any cross-cultural experience.

One of the reasons proposed for Anglo children's academic success is their greater tolerance for monotony; affective stimulation and vivacity are necessary for the Black child to be motivated to achieve in academics. Schools do not support the natural energy level of Black children who need an active environment for successful learning. Black children elicit more punishment and are labeled hyperactive more frequently because of their high motoric activity.

The Black home environment provides an abundance of stimulation, intensity, and variation through high noise levels and large numbers of people; analyzed as over-stimulation and conceptual deafness by some social scientists, Boykin (1978) proposed greater psychological and behavioral verve in Black children as a result. Rapport with the teachers in educational settings seems to be strongly related to academic performance for Black students.

Research further indicates that many at-risk students have not been taught with strategies, methods, materials that facilitate their learning style preferences and strengths. Mismatching students' learning styles with instruction results in their feeling anxious and even physically ill; the cerebrum "downshifts" during anxiety. When learning styles have been matched to appropriate instructional approaches, teachers have reported sharp decreases in stress.

The differences between children who function with relational and analytical styles is so great that children whose cognitive organization is relational are unlikely to be rewarded with grades regardless of their native ability, extent of learning, or experiences; children who live in more fluid or "shared-function" primary groups are more likely to exhibit the relational cognitive style.

Educational designs which select one body of information to be presented to all students at a set time and at some forced rate cannot possibly accommodate all learners. The only valid school reform is that which considers students' varied differences and strengths. Research indicates that many at-risk students have not been taught with strategies, methods, materials that accommodate their learning style preference and strengths.

A further implication of the review of research, and perhaps the most significant finding, is the support for a restructuring of the environment to better meet the needs of <u>all</u> students. Traditional American education has worked only slightly better for Anglo students of European descent than it has worked for minority students. Social class and ethnic group affiliation, by birth or by choice, are structures as predominant as "race"--a

ubiquitous terms, at best--in producing life-styles and development. A person's behavorial style is usually a cultural frame-work for how that person views the world; successful people integrate different styles.

The research suggests that even beyond race, ethnic group and social class the person's everyday life experiences impact significantly on cognitive development. The implication is that even for teachers of supposed homogeneous groups of students, each student must be viewed as the ever changing product of a unique culture. Recognizing that each student "hears a different drummer" is the first challenge; encouraging students to "step to the music" will maximize learning for all students--by far education's greatest challenge.

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APPENDIX A
REVIEW OF LITERATURE CATEGORIZATION

REVIEW OF LITERATURE CATEGORIZATION

AUTHOR(S) YEAR	SUBJECTS	ASPECTS	FINDINGS
O.A Cattey (1980)	**Navajo, Chinese, Anglo-American cultures**	*** Cultural differences in processing information**	**** Both the Chinese & the Navajo cultures: ** employ language differently than Anglos ** employ right-hemispherically oriented myths, metaphors, symbols, and allegories ** stress harmony & unity --a basic "oneness"**
Callaghan	Navajo & Anglo mothers & infants	* ethnic differences; agressiveness; visual contact	** Navajo babies showed greater passivity ** Navajo mothers used their eyes rather than their voice to attract the baby's attention
Colliers (1967)	Navajo children	* visual discrimination	** Navajos excel at tasks requiring fine visual discrimination
Coombs Coleman	Navajo children	* imagery/ verbal coding	** Navajo children excel in spelling (visual) while Anglos excel in vocabulary (verbal)
Feldman Dittman (1970)	Indian children	* motor coordination	** pre-school Indian children evidence fine motor coordination
Freedman (1979)	Chinese, Caucasian, & Black babies	* ethnic differences	** Chinese babies are more amenable & adaptable in situations where other babies register annoyance and complaint
Havighurst (1957) John (1972) Coombs (1958)	Indian children	* imagery/ verbal coding	** Indian children learn more rapidly through imitation & direct visual & tactile experiences than through verbal processes

John (1972)	Navajo children	* styles of learning/visual	** Indian children of the Southwest are visual in approaches to the world
Kuipers	Navajo children	* visual & spatial configuration	** Navajo youngsters manifest greater sensitivity to geometric designs than white children of the same age
Scott (1979)	Navajo, Hopi Indians	* cerebral speech lateralization/ hemispheric orientation	** Navajos demonstrate a left ear (right cerebral hemisphere) advantage compared to the traditional right ear in Anglos ** lateralization for language in the Native American Hopi differs more dramatically than would be expected
O.B			
Lewis Gingerich (1980)	**American Indian & non-Indian graduate students**	*** Leadership**	** Indian students have a very different concept of a leader ** a task produces a leader and with the end of the task the function is fulfilled--a leader manifests different degrees of leadership behavior ** the quality of the leader's values stressed over the person
O.C			
Halpin Halpin Whiddon (1980)	**American Indian & White children**	*** Self esteem, locus of control**	** Identification of specific parental behaviors across both cultures that appeared to be antecedents of an internal locus of control and positive self esteem
1.A			
Hale (1981)	**Black children**	*** Cultural influences**	** Learning environments do not match the culture & learning styles of Black students

Akbar (1975)	Afro-American child	*cultural characteristics	** **The Afro-American child:** ** is highly effective ** uses language requiring a wide use of many coined interjections ** uses considerable body language ** relies on words that depend upon context for meaning ** prefers using expressions that have several connotations ** adopts a systematic use of nuances of intonation and body language such as eye movement and positioning ** prefers oral-aural modalities for learning communication ** is highly sensitive to others' nonverbal cues ** seeks to be people oriented ** is sociocentric ** uses internal cues for problem solving ** feels highly empathetic ** likes spontaneity ** adapts rapidly to novel stimuli
Boykin (1978) Holt (1964) Silberman (1970)			** suggested the reason White children are more academically successful is that they have a greater tolerance for monotony; affective stimulation and vivacity are necessary for the Black child to be motivated to achieve in academics

Boykin (1978) Marans Lourie (1967) Goldman Sanders (1969) Wachs Uzgiris Hunt (1971)			** suggested that the Black home environment provides an abundance of stimulation, intensity, & variation through high noise levels & large numbers of people; analyzed as over stimulation & conceptual deafness by some social scientists, Boykin proposed greater psychological & behavioral verve in Black children as a result
Brazelton Young Bullowa (1971)	Zambian & White American mothers	* Early development	** Zambian mothers' high contact, loving environment for their babies provided more handling & feeding contact & produced more stimulation, alertness, social interest and consolability
Cohen (1971)			** differences between children who function with relational & analytical styles is so great that children whose cognitive organization is relational are unlikely to be rewarded with grades regardless of their native ability, extent of learning, or experiences; children who live in more fluid or "shared-function" primary groups are more likely to exhibit the relational cognitive style
Dixon Foster (1971)			** the non-Western heritage of Afro-Americans suggests knowledge stems from the proposition that, "I feel, therefore I think, therefore, I am" vs. "I think, therefore, I am."

Esen (1973)	Nigerian culture	child-rearing practices	** referred to clusters of African attitudes as "care syndrome"; children grow up in a social network characterized by physical closeness, acceptance & care
Gitter Black Mostofsky (1972) Young (1970)			** found Black children to be more feeling oriented, people oriented, & more proficient at non-verbal communication than White children
Hilliard (1976)			** **Afro-American people:** ** tend to view things in their entirety & not as isolated parts ** seem to prefer inferential reasoning rather than deductive or inductive reasoning ** tend to approximate space, number, & time instead of aiming for complete accuracy ** appear to focus on people & their activities rather than objects ** have a keen sense of justice & quickly perceive injustice ** tend to prefer novelty, personal freedom & distinctiveness ** in general, tend not to be word dependent, but are proficient in non-verbal as well as verbal communication
Lester (1969)			** Black culture emphasizes the nonverbal; experience counts, not what is said

Morgan (1976)	** maintained that schools do not support the natural energy level of Black children who need an active environment for successful learning; Black children elicit more punishment and are labeled hyperactive more frequently because of their high motoric activity
Newmeyer (1970) Young (1970) Gitter Black Mostofsky (1972)	** supported the hypothesis that Black culture develops proficiency in nonverbal communication
Piestrup (1973)	** identified factors which created good rapport in teacher-Black student interaction: warmth, verbal interplay during instruction, rhythmic style of speech & distinctive intonation in speech patterns
Silberman (1970)	** described stylistic dimensions of the oral tradition in Black culture: call and response, rhythmic patterns, spontaneity & concreteness
Young (1970)	** suggested that White children are object oriented & have numerous opportunites to manipulate objects & discover properties & relationships; Black children are more people oriented; the affective orientation is linked to the greater continuity in the behavior of Black mothers

Zigler Butterfield (1968) Zigler Abelson Seitz (1973)			** rapport with the teacher in educational settings seems to be strongly related to academic performance for Black students & not very critical for Whites
2.A **LeBrasseur Freark (1982)**	**American Indian**	* **Cultural values**	** Many different Indian tribes have the following values that may influence school performance: avoidance of competition, high value on cooperation, strong peer influence ** proposed teaching strategies for Native American students
2.B **Knight Kagan (1982)**	**Anglo-American & Mexican-American family structure**	* **Cooperative Competitive Social Behavior**	** Reported the absence of a relation between social behavior & the number of siblings & birth order; family size and ordinal position of the child may interact with other factors (McClintock et al., 1979) in influencing prosocial behavior
McClintock Bayard McClintock (1979)			** suggested the larger size of the M-A family, strength of familial interdependence, and patterning of relationships as reasons for their relatively greater preference for cooperative or prosocial outcomes in interdependent situations
Ribal (1963) Sawyer (1966)			** suggested larger family size is associated positively with generosity

Staub (1970) (1971a/b)			** the cultural difference in family size may have resulted in a higher proportion of older siblings among the M-A children which may have resulted in a cultural difference in social behavior
2.C **Marashio (1982)**	**Sioux, Tewa, Hopi, Winnebago**	*** Traditional Native Americans' perspectives toward teaching and learning**	** Juxtaposed the traditional holistic approach to learning that pervades Native American culture with the utilitarian education commonly experienced in Euro-American schools
2.D **Ross (1982)**	**Native American**	*** Brain Hemispheric Functions**	** Native Americans are more dominant in right hemispheric thinking
2.E **Tafoya (1982)**	**American Indian**	*** Traditional teaching paradigms** * child-rearing practices	** Traditional Indian learning focuses on: process over product, legends and stories as traditional teaching paradigms, knowledge obtained from the self, cognitive development through problem-solving techniques
Scallon Scallon (1979a)	Athabaskan Indian children	* literacy & orality	** orality rather than essayist literacy
Scallon Scallon (1979b)	Athabaskan Indian children	* child-rearing practices	** children observe from subordinate positions
2.F **Trimble Richardson (1982)**	**American Indian adults**	*** Locus of control**	** Ethnic minorities and those from low SES levels score in a more external locus of control direction than Caucasians

Gurin Gurin Lao Beattie (1969)	Black students	** with adequate SES controls differences in locus of control may disappear
Lefcourt (1966)		** measuring locus of control for Black youth requires distinguishing how much control one believes most people in society possess (control ideology) and how much control one believes one personally possesses personal control)
Reynolds (1976)		
Tyler Holsinger (1975)	American Indian & Caucasian students	
Echohawk Parsons (1972)	American Indian & Caucasian students	** may be negative implications to internal beliefs for some minority groups ** separate factors for (1) personal effort and attributes and (2) chance & supernatural
Jessor Graves Hanson Jessor (1968)	American Indian, Caucasian, Spanish American peoples	** separation of personal control from ideological control requires more research in the structural equivalence of the various scales to measure locus of control
Munro (1979)	Blacks & Whites in Africa	
Ryckman Posen Kulberg (1978)	Rhodesian & American students	
Parsons Schneider (1974)	People of Western, Eastern & Middle Eastern countries	
Jones Zoppel (1979)	Black populations in Jamaica & U.S.	
Trimble (1981)	Indian & Alaska Native populations	

3.A **Sapp** **Elliott** **Bounds** **(1983)**	**Black & White Urban College students**	*** Learning styles**	**** Students demonstrate participative and collaborative learning styles more than avoidant, competitive, dependent or independent**
4.A **Cheek** **(1984)**	**Native Americans**	*** Math education**	**** Proposed directions for research based on 7 guiding questions regarding mathematics education for Native Americans**
Scott (1983)	Pueblo & White students entering teacher training	* mathematics achievement test scores	** Pueblo students scored higher on application problems related to real-world experience; the applications-oriented approach stressed in teaching math may be even more important to native students
4.B **Bradley** **(1984)**	**Native American**	*** Culture and learning styles related to learning math**	**** Navajo students:** ****** learn more effectively through culture-based mathematics though mainstream mathematics cannot be pushed aside; very little research has been done relating the indigenous mathematics of Native Americans to school mathematics ** traditional Indian communities have highly sophisticated forms of nonverbal communication
Moore (1982) Smith (1981)	Navajo	* culture and learning styles related to learning mathematics	** speak a language that does not have a word for multiply, divide, if, cosine or sine, nor do students have the beliefs associated with them

			** find it difficult to accept equations as equal if the member parts are not identical ** have difficulty accepting problems in which a hypothetical situation is expressed ** in traditional Indian cultures are required to develop excellent memory skills, skills which may be a barrier in higher mathematics
Green (1977)	American Indians	* math education	** rebel against stringent discipline of high schools and choose not to study the most disciplined, visible Western forms of education
Cardell Cross Lutz (1978)	Mescalero Apache students	* math education peer learning	** achieved greater gains in math skills when spontaneous groups were formed by students for math activities
4.C **Loflin (1984)**	**Eskimo children**	*** Cognitive abilities**	** Proposed a model for reconstructing the logic underlying the communicative interaction of native Alaskan children to determine their natural reasoning ability
4.D **Mahan (1984)**	**Anglo student teachers; Navajo, Hopi, & Apache elementary students**	*** Cultural & methodological concerns**	** Administration of a "Frequent Concerns" survey of student teachers revealed they can be culturally sensitive to reservation school Indian students
4.E **Mahan Henderson (1984)**	**Navajo**	*** Cultural influences**	** Socioeconomic and cultural factors influence the effectiveness of education for the

	Navajo perception of education as an all-encompassing, life-long process contrasts with the institutional, systemized, and fragmented nature of mainstream educational approaches
Guthrie Hall (1981)	** cultural factors influence educational success or failure
Jencks Smith Acland Bane Cohen Gintis Heyns Michelson (1972)	** the most important determinant of education attainment is family background ** Indians have traditionally received inferior education & have been assigned low status & menial jobs leading to the perception of schooling as having little value in improving social & occupational status
Ogbu (1978)	** cooperation is stressed over competition ** the traditional Navajo independent life style based on seasonal changes contrasts with the 180-day structured school system ** Navajo custom of reticence on a first encounter with an unfamiliar person or situation creates difficulties on the very first day of school ** Navajo students may avoid eye contact with a teacher as a sign of respect for an elder ** Navajo children are given tremendous responsibility at a very young age; Navajo girls, as members of a matrilineal culture, have prestige and influ-

			ence over what happens in the home & are often owners of livestock and materials ** threats of physical punishment & force are unacceptable and ineffective methods of behavioral control in Navajo culture while teasing or shaming are common ** for Navajo students, praise may not be reinforcing ** Navajo children are taught to live for and be concerned with the present ** rather than "Explain-Read-Do-Recite" approaches to learning, Navajos prefer learning through extensive observation and imitation, along with the assurance of success ** Navajo cultural and religious taboos may be ignored by certain literature selections and art activities
5.A Allen Merrill (1985)		* Learning strategies	** Proposed adapting instructional intervention to match the learning strategies of individuals
5.B Chilcott (1985)	Arizona Yaqui Indians	* World view	** The Yaqui world view is not accommodated by modern industrial society and its system of education
5.C Keefe (1985)		* Learning style variables	** Learning style characteristics reflect genetic coding, personality development, and environmental adaptation

Letteri (1982)			** since some skills are more productive of school achievement than others, training should focus on enhancing these analytical skills, rather than matching styles
Keefe, ed. (1979)	Review of literature	* student learning styles	** the NASSP developed a multidimensional view of style with "Learning Style" as the all encompassing concept label for 21 elements; accepted Osborne & Wittrock (1983) models of generative learning; objective of providing teachers and learners with a workable diagnostic tool for more personalized education
Keefe, ed. (1982)	Review of literature	* student learning styles and brain behavior	
Keefe Languis (1983)			** defined 3 broad categories of style: cognitive, affective, physiological; style itself conceived of as a "gestalt"
5.D			
Light Martin (1985)	**Review of literature on Native American culture**	*** American Indian culture's traditional view of children**	** American Indian approaches to child guidance: ** dependence on adults ** respect for elders ** obedience through explanations for desired behavior
Gridley (1974)			** Indian children were taught to respect life
Terrell Terrell (1974)			** many rituals, like the Hopi Kachina, are related to children

Llewellyn Hoebel (1967)	Cheyenne Indians	* self-control, self-restraint; childrearing customs	** children are to have parents' full attention, subsequently learning to respect elders; chastisement of children is abhorred ** children are encouraged to play in such ways that train them for adult responsibilities
Opler (1946)	Jicarrila Apache Indian	* childrearing customs	** the grandparent serves as main disciplinarian; rigorous training to teach moral standards and develop character
Gill (1982)	American Indians	* childrearing customs	** American Indians attach a high degree of importance to childhood as the time for beliefs, values, and attitudes instruction
5.E			
Ogbu (1985)	**Minority groups**	*** Primary and secondary cultural differences**	** Explored societal treatment of minorities and nature of minorities' own response to treatment to support need for understanding minority learners' sense of social identity and cultural frame of reference that develop and influence their strategies toward schooling; proposed accommodation without assimilation
5.F			
Osborne (1985)	**Native North Americans**	*** Cognition**	**Native North Americans:** ** have strengths which are not tapped by tests traditionally used by Western societies ** may develop compensatory skills because of rigors of survival in traditional environments
Dennis (1943)	Hopi Indians	* animism * consciousness of inanimate objects * moral realism	

Cole Gay Glick Sharp (1971)	Kpelle	* cross-cultural	** particularly the Inuits may have developed greater figure skills than other cultural groups
Annis Frost (1973)	Euro-Canadians & Cree Indians	* visual acuity * environment	** are more dominant in right hemispheric thinking related to creative abilities
Kleinfeld (1973) (1975) (1979)	Inuit, Eskimo & Indian students	* visual, spatial, aural modes * watch-then-do learning style * memory coding * cross-cultural testing	** may respond more accurately via the left ear on listening tasks ** particularly the Navajo, as well as the Chinese, are likely to be better in visual discrimination skills
McArthur (1973)	Inuits & Nsengas	* psychometric intelligence	** as well as non-Indian students, may develop cognitive styles across age cohorts rather than longitudinally
Anhelm (1974)	American Indian & Anglo students	* visual preferences	** may prefer contrast over Anglo preferences of angularity, linearity, and curvilinearity
Beaulieu (1974)	Sioux & Mohawk	* perceived information needs * environment	** the visual acuity differences of Native Americans may be tuned by the early visual environment; the carpentered nature of urban surroundings may result in greater awareness of horizontal and vertical lines among urban dwellers as opposed to people who live in non-carpentered environments
Cole Scribner (1974)			
Steinburg (1974)	Canadian Indians	* psychometric & operative intelligence	
Dasen (1975)	Inuit Indians; Ebrie, Africa; Aboriginals, Australia	* perception skills * conservation skills	
Norton (1975)	Caucasian, Black, & Indian Children	* nonverbal behaviors	** emphasize watching, listening, and waiting in order to learn
Albas McCluskey Albas (1976)	White Canadians & Cree Indians	* emotional content of speech	** develop high self-esteem in school through praise of grades, parental pleasure at their effort, and praise
Granzberg (1976)	Euro-Canadians &	* self-control * dependence	** do not become more future-oriented with age, as do Anglo students

	Cree Indians	* abstract ability	** may define self-control differently than other cultures
Serpell	Navajos & Anglos	* hemispheric dominance * environment	** may identify emotions from vocalizations by members of their own culture far more accurately than those by members of other cultures
Shannon (1975) (1976)	Native Americans, Mexican-Americans & Anglos	* perceptions of time	** may perceive nonverbal behaviors of teachers differently because of cultural group membership
Kagan Buriel (1977)	Mexican-Americans	* field dependence/ independence	** may have a different world orientation than people of other cultures
Martin (1977)	Indian & Non-Indian Students	* developmental levels	** may have a different perception of time than people of other cultures
Odell (1979)	Navajo Adults & Children	* developmental levels	** evidence no significant difference regarding operational abilities when compared to whites
Scott (1979)	Navajos & Anglos	* hemispheric dominance	** may find direct instruction superfluous when modeling has occurred
Scott Hynd Hunt Weed (1979)	Navajos	* hemispheric dominance * speech lateralization	** may benefit from both operative and psychometric intelligence investigations
Swanson Henderson (1979)	Papago Children	* visual discrimination * direct instruction	** may develop a broad cluster of spatial-field-independence abilities and a distinctive cluster of abilities involving inductive reasoning from nonverbal stimuli because of ecology and child-rearing practices
Cattey (1980)	Chinese & Navajos	* child-rearing practices * hemispheric dominance	
Halpin Halpin Whiddon (1980)	Flathead Indians & Anglos	* self-esteem * locus of control * child-rearing practices	** may not receive valid results on psychological tests used in particular cultural contexts
Sampson (1981)	Black, White, & Indian Students	* formal operational ability * reading ability	

Masden (1982)	Hopi Indians	(replication of Dennis's 1943 study)	
Tafoya (1982) Witkin Moore Goodenough Cox (1977)	American Indians	* child-rearing practices * watch-then-do learning style * storytelling * cognitive styles	
5.G			
Schindler Davison (1985)	**American Indian learners**	*** Language, culture, & mathematics concepts**	** Any classroom that may contain children whose dominant language is not English, requires a teacher who can analyze the dominant language and create a second language of mathematics descriptions that are meaningful ** indigenous peoples are often unable to solve mathematics problems that are not perceived as culturally relevant ** native speakers of Navajo find it difficult to construct an exactly parallel systematic analysis of math concepts in English
Bradley (1984)	Navajo students		** Navajo language do not have words for multiply, divide, if, cosine or sine; students have difficulty with concepts for which their language has no words, such as a hypothetical situation
Closs (1977)	Copper Eskimo culture		** tells of the analogous story told to show the futility of counting beyond everday numbering

Leap McNett Cantor Baker Laylin Renker (1982)	American Indian elementary students		** Picuris American Indian math involves knowing when "not" to count -- computational "silence"; a math operation that is not typically performed in an American Indian language creates conflict between what is linguistically possible and culturally real
Gay Cole (1967)	Kpelle of Liberia		** presenting math concepts in English without consideration of Kpelle language development & cultural usage led to rote memorization without comprehension of concepts
Smith, L. (1981) Moore, C. G. (1982)	Navajo students		** styles of thought & communication in the Navajo language influence the students' approach to learning math concepts & solving problems
6.A **Lee, M. W.** **(1986)**	**Black students**	*** Learning styles & computer programming**	** Cognitive styles can be more appropriately matched through the use of computers; self esteem is also enhanced ** one's level of knowledge is increased when one functions competently in both the relational & analytical thinking styles ** Black children are often proficient in the relational learning styles which emphasize visual and audio stimuli & not in the analytical skills valued in American public schools

			** teaching Black children computer programming at an early age provides them opportunities to develop analytical thinking skills while their environment is teaching them to function with relational thinking skills
Cole (1971)			** cognition develops in conjunction with the behaviors in which people engage in everyday life, regardless of ethnic group affiliation
Hale (1981)			** a person's behavioral style is usually a cultural framework for how that person views the world; successful people integrate different styles
Havighurst (1976)			** social classes & ethnic groups are two major ecological structures that produce diversity in human lifestyles & development
Sheingold Pea (1981)			** programming computers encourages development of problem-solving skills
Stodolsky Lesser (1967)			** different kinds of intellectual skills are fostered/hindered in different environments
Webb (1983)			** relational learners fail in school far more often than analytical learners
6.B			
Amodeo Brown (1986)	**Students from Mexico**	*** Differences in Mexican & American schools regarding acceptable behavior**	**In Mexico:** ** students' interactions with their teachers tend to be formal

			** students are to be punctual ** students are to respect authority ** students are graded on manners and academics ** students are to be acknowledged before speaking ** the lecture method is widely used
Estrada LaBelle (1979)	Mexican students	* learning styles	** schools emphasize cooperation
6.C			
Valdivieso (1986)	**Hispanic students**	*** Academic achievement**	** Hispanics are in greater need of a home-to-school link
7.A			
Foreman (1987)	**American Indians**	*** Self-determination**	** Educational designs which select one body of information to be presented to all students at a set time and at some forced rate cannot possibly accommodate all learners
Ross (1982)	Native Americans	* brain hemispheric functions	** Native Americans are more dominant in right hemispheric thinking
7.B			
McNeil (1987)		*** Learner differences**	** the only valid school reform is that which considers students' varied differences & strengths
7.C			
More (1987)	**Native Indians**	*** Internal Cognitive Process**	**Native people evidence:** ** a higher frequency and relative strength in global processing on both verbal and non-verbal tasks ** a relative strength in simultaneous processing, but a
MacArthur (1968)	Canadian Eskimos/ Northern Canadian Indians	* field dependence/ independence	

Weitz (1971)	Algonkian/ Athapaskan	* field dependence/ independence	possibility that sequential processing abilities develop much slower than simultaneous skills because they are not used in the primary grades
John (1972)	Navajo children	* imagery	
Krywaniuk (1974)	Native Indians	* simultaneous/ successive cognitive processes	** the possibility of using strengths in simultaneous processing to develop sequential processing
Messer (1976)		* impulsive/ reflective	** a higher frequency and relative strength in processing visual/spatial information
Witkin Moore Goodenough Cox (1977)		* field dependence/ independence	** a higher frequency and relative strength among Indian students in using imagery for coding and understanding
Das Kirby Jarman (1979) (1982)		* simultaneous/ successive cognitive processes	** reflective more than impulsive (or watch-then-do rather than trial-and-error) processing
Bradshaw Nettleton (1981)		* global/analytic	
Das Manos Kanungo (1975)	Canadian Native, Black & White children	* cognitive & personality tests	
Tafoya (1982)	American Indians	* imagery/ verbal coding	
Kaufman Kaufman (1983)	Navajo & Sioux	* simultaneous/ successive cognitive processes	
Greenbaum Greenbaum (1983)	American Indians	* imagery/ verbal coding	
Kirby (1984)		* simultaneous/ sequential cognitive processes	

More (1984)	Okanagan/ Nicola Indians	* imagery/ verbal coding * impulsive/reflective * field dependence/ independence * global/analytic * simultaneous/successive cognitive processes
Cullanine (1985)	Native Indians	* field dependence/ independence
Bryant (1986)	Native Indians	* imagery/ verbal coding
Karlebach (1986)	Native Indians	* imagery/ verbal coding
Williams (1986)	Tsimshian Native Indians	* simultaneous/ sequential processes
		*** External Conditions**
Vernon (1969)	Northern Canadian Indians & Inuits	* visual, auditory, and kinesthetic sensory modes
Bowd (1971)	Native Indians	* spatial/mechanical abilities
Kaulbach (1984)	American Indians & Eskimos	* visual, auditory, and kinesthetic sensory modes
		*** Teaching and Communication Styles**
Kleinfeld (1972)	Indians & Eskimos	* teaching styles/ communication styles
Philips (1972)	Warm Springs Children	* communication styles
Erickson Mohatt (1982)	Indian Students	* communication styles
Scallan Scallan (1983)		* interethnic communication styles

Smith Renzulli (1984)		* teaching styles/ learning styles * **Traditional Learning Styles**
Vernon (1969)	Native Indians	* global learning styles
Gue (1971)	Native Canadian Indians	* value orientations
Weitz (1971)	Native Canadian Indians	* cross-cultural cognitive styles
John (1972)	Navajo Children	* learning styles * storytelling
Philips (1972)	Warm Springs Children	* communication styles
Berry (1976)	Native Indians	* cross-cultural cognitive styles
Davis Pyatowski (1976)	Indian Children	* value orientations
Berry (1980)	Native Indians	* communication styles
Davidman (1981)		* learning styles
Erikson Mohatt (1982)	Indian Children	* communication styles
Ross (1982)	Native Americans	* brain hemispheric functions
Tafoya (1982)	American Indians	* child-rearing practices * learning styles * storytelling
Scallon Scallon (1983)	American Indians	* storytelling * talking about self * child-rearing practices

		* self-testing * learning style	
Chrisjohn Peters (1986)	American Indians	* brain hemispheric functions	
Pepper Henry (1986)	Native Indians	* learning styles	
7.D			
Ogbu (1987) (1986) (1983) (1982a) (1982b) (1977) (1974)	**Asian-American, Black, Chicano, Chinese, Filipino, Japanese, Mexican American, Mexicano, Native American, Native Hawaiian, Puerto Rican, Punjabis, East Asian, West Indian, White American, Central & South American immigrant students**	*** Cultural domains and minority performance in school * Primary & secondary cultural differences**	** The main factor differentiating more successful from less successful minorities appeared to be nature of history, subordination, and exploitation of the minorities and nature of the minorities' own instrumental and expressive responses to their treatment ** students may attend school with different assumptions about "getting ahead" based on primary cultural differences ** minority groups who do well in school are those who differ more from the dominant group in language and culture ** students may attend school with a different style of learning than the one emphasized at school ** the Chinese have a traditional style of learning that emphasizes external forms & rote memorization ** difficulties in crossing cultural/ language boundaries, folk theory of making it and survival strategies, and distrust of white people and the public schools

			shape the schooling strategies of involuntary minorities ** in the 1930's, Asian American & Mexican-American students were experiencing difficulty with the English language in American public schools; by 1947, the Asian-Americans had conquered the limited language proficiency problem but the Mexican-Americans were still experiencing difficulty ** in the 1960's & 70's, Chinese, Filipino, & Japanese students did better than Black and Mexican-American students in the same schools
Suarez-Orozco (1987) Matute-Bianchi (1986) Valverde (1987) Woolard (1982)	Hispanics	* school achievement	** Hispanics of Central & South America and Cuba do better than Mexican-American, native-born Chicano, & Puerto Rican students and are less likely to dropout
Coleman (1966) Slade (1982)		* standardized testing	** Asian-American students did better than other language & cultural minorities on standard exams
Gibson (1983) Matute-Bianchi (1986) Suarez-Orozco (1986)			** cross-cultural evidence of varibility in minority school performance facing cultural, language, and other barriers

Vogt Jordan Tharp (1987)	**Native Hawaiian & Navajo children**	***Cultural compatibility/ incompatibility**	**** Culturally specific compatibilities contribute to educational effectiveness; cultural incompatibility is one credible explanation for school failure; elements found effective for Native Hawaiian children are not culturally compatible or effective for Navajo children** ** Hawaiian teaching-learning interactions are characterized by voluntary participation; traditional school-culture script is "one person at a time" ** indirect praise and praise to a group more effective than direct praise of one child ** industriousness required school adaptation to children's culturally based skills and inclinations ** management routines compatible with Navajo culture were more effective: ignoring misbehavior or lowering one's eyes, indirectly referring to the misdeed while praising honorable behavior standards
Au (1980) Au Jordan (1981)	Native Hawaiian children	* reading comprehension	** emphasis on teacher responsiveness to children's talk generated spontaneous change in interaction style and sociolinguistic participation structures
Cazden John (1971) John (1972)	American Indians	* thought processes/ holistic	** holistic nature of thought characterized by a preference for working with the whole before attempting analysis of

Phillips (1972) White Tharp Jordan Vogt (1988)			parts or sections (linear)
Crowell (1977) Gallimore Boggs Jordan (1974) Klein (1981)	Native Hawaiian children	* positive reinforcement & on-task behavior	** motivation, content coverage, & industriousness did not result in school success as measured on standardized tests; selection of educational practices based, in part, on their cultural compatibility produced success on standardized reading tests
D'Amato (1986)	Native Hawaiian children	* personal interaction	** balance required between warmth or solidarity and toughness or autonomy; these extremes were ineffective with Navajo children
Jordan (1977)	Native Hawaiian children	* instructional practice	** emphasis on comprehension, focusing on meaning over decontextualized skills drill, is more effective
Gallimore Boggs Jordan (1974) Jordan (1977) (1984)	Native Hawaiian children	* classroom interaction	** pattern of multiple caretakers and companion groups in natal culture manifests itself in high rates of peer interaction, frequent scanning for other children's errors, and offering and soliciting peer help
Jordan Tharp Vogt (1985)	Navajo children	* male/female roles	** separation of sexes clearly defines cultural roles

Anderson (1988)	**Anglo-European Whites, Cajun Whites, Appalachian Anglos, American Indians, Mexican-Americans, African-Americans, Vietnamese-Americans. Puerto Rican-Americans Chinese-Americans Japanese-Americans Europeans**	*** Cognitive/ Learning Styles**	**Non-Western populations often:** ** differ in world views and cosmic orientations ** emphasize group cooperation ** reflect group vs. individual achievement ** value harmony with nature ** experience time as relative ** accept affective expression ** comes from extended families ** think holistically ** view religion as inseparable from culture rather than as a distinct part ** accept the world view of other cultures without expressing the superiority of their own ** are socially, not task, oriented ** perceive elements as a part of a total picture ** depend on verbal tasks ** learn better from materials which have a human/social content and which are characterized by fantasy and humor ** are strongly influenced by authority figures' expressions of confidence or doubt in their performance ability ** often find their learning styles conflict with traditional
Allport Pettigrew (1957)	African & European Children	* perception of movement	
Bruner (1966)	African & European Children	* perception of conservation task	
Witkin (1967)		* environmental factors	
Wober (1967)	Africans	* cognitive systems	
Gagne Gephart (1968)	Blacks	* disjunctive/ conjunctive concepts	
Killbride Robbins (1968)	Blacks & Whites	* linear perspective * depth	
McNeil (1968)	Blacks & Whites	* school environment	
Cohen (1969)	Mexican-American, Puerto Rican, & Black children	* school environment * field dependence/ independence * communication style	
McNeil Phillips (1969)	Blacks & Whites	* school environment	

Mbiti (1970)	Africans	* world orientation	school environments ** often find their
Messick (1970)	Mexican-Americans	* field dependence/ independence	communication styles conflict with Western communication styles
Dregoski Serpell (1974)	African & European children	* classification system	** use imagery as a dominant way of thinking, writing, conceptualizing, and speaking
Kagan Madsen (1971)	Mexican, Mexican-American, Anglo-American Children	* motivational styles	** tend to use the second person "you" to reflect group identity
Wilson (1971)		* learning styles	** think in descriptive abstractions ** perceive thought as wholistic
Matthews (1973)	Blacks & Whites	* evaluation of reality * cognitive systems	** emphasize extensive expression of concrete emotional words and metaphors
Ramirez (1973)	Mexican-Americans	* field dependence/ independence	** introduce themselves into the objectives of events
Ramirez Price-Williams (1974)	Mexican-Americans & Anglo-Americans	* field dependence/ independence * motivational styles	
Vygotsky (1978)		* communication style	
Cooper (1980)		* holistic learning * communication style	
McDermott (1980)	Blacks	* holistic/ affective learning	
Baldwin (1980)	Blacks	* world orientation	
Brown (1986)	Blacks	* holistic/ affective learning	
Sandefur (1987)		* teaching styles	

8.B			
Banks (1988)	**Black, Chinese, Irish Catholic, Jewish, Mexican-American, Puerto Rican, White students**	*** Ethnicity, class, cognitive, and motivational styles**	**** While ethnicity is to some extent class sensitive, its effects persist across social-class segments within an ethnic group ** social class causes within-ethnic-group variations as well**
Lesser Fifer Clark (1965)	Chinese, Jewish, Black, Puerto Rican students	* verbal ability; reasoning; number facility; space conceptualization	** the 4 ethnic groups were markedly different in both the level of each mental ability and the pattern among those abilities
Lesser Fifer Clark (1967)	Chinese, Black, Irish Catholic students	* replication of '65 study; verbal; ability; reasoning; number facility; space conceptualization	** data for Chinese and Black students similar to data on these from earlier study; I.C. showed neither a distinctive ethnic-group pattern nor similarity of patterns for the two social classes (middle and lower)
Burnes (1970)	Black & White students	* scores on WISC	** significant social-class differences in scores, but no significant racial class differences; scores on sub-tests for Blacks and Whites did not show a pattern by race or cultural group
Backman (1972)		* mental ability factors and relation to ethnicity, social class, and sex	** sex accounts for 69% of the total variance in the shape of patterns; ethnicity for 13%; social-class group, 2%

Siegel Anderson Shapiro (1966)	Black students	* categorization behavior of lower-class and middle-class preschool	** lower-class and middle-class children differed in their ability to group pictures, not objects; l.c. children formed groups based on interdependence of items; m.c. children formed grouped on basis of common physical attributes
Orasanu Lee Scribner (1979)	White & Black children	* development of category organization and free recall	** White children sorted taxonomically more often than did Black children, who showed preference for functional sorting; although they showed differences in organizational preferences, they showed no differences in recall
Rychlak (1975)	White & Black children	* affective learning styles	** moving from positive to negative reinforcement value across lists resulted in less non-specific transfer than moving from negative to positive reinforcement across successive lists; the pattern was more apparent for Blacks than Whites, for lower class than middle class students
Trotman (1977)	Black & White students	* socialization & intellectual environment	** higher level of intellectual home environment for m.c. Whites than for m.c. Blacks; cultural difference in home experience and parent-child interactions in Black and

			White families of same social class
Moore (1985)	Black children	* intelligence test performances as indicated by WISC scores	** Black children adopted by White families scored higher
Kamii Radin (1967)	Black mothers & their pre-school children	* socialization practices	** practices of lower-lower and middle-class Black mothers differ significantly -- social class is not a determinant of behavior but a statement of probability that a type of behavior is likely to occur
Witkin (1950 & 1962) Witkin & Goodenough (1981)		* learning styles; field dependence/ independence	** some learners are field independent and easily perceive a hidden figure on the Embedded Figures Test while others are field dependent and find it difficult to perceive because of the obscuring design
Ramirez Castaneda (1974)	Mexican-American students	* field independent & field sensitive learning styles & behaviors	** Mexican-American children tend to be field sensitive (like to work with others to achieve a common goal) and are sensitive to the feelings and opinions of others; teachers prefer field-independent students and assign them higher grades, though cognitive style is not related to measured intelligence or IQ
Cohen (1969)		* analytic & relational learning styles	** styles of thinking are produced by the kinds of families and groups in to which students are socialized

Ramirez Price- Williams (1974)	Mexican- American, Black, & Anglo students	* field dependent/ independent	** Black and Mexican-American students scored in a significantly more field dependent direction than did Anglos; teachers' level of field independence does not differ significantly from that of Anglo students; social-class effect was not significant in the study
Perney (1976)	Black & White students	* field dependent/ independent	** significant field dependence differences between Black and White students and between males & females; Black females were the most field dependent subjects in the study
Garner Cole (1986)		* field dependent/ independent, locus of control	** both field dependent and locus of control are related to academic achievement with field dependence being more important; when locus of control and field dependence were combined, locus of control dominated
Battle Rotter (1963)		* locus of control	** locus of control is related primarily to social class rather than race or ethnicity
8.C			
Carbo Hodges (1988) Carbo (1987) Carbo Dunn Dunn (1986) Della Valle Dunn Dunn Geisart	**Review of literature**	*** Learning styles**	** Research indicates that many at-risk students have not been taught with strategies, methods, materials that accommodate their learning style preferences and strengths ** mismatching students' learning styles with instruction results in their feeling anxious & even physically ill;

Sinatra Zenhausern (1988) Dunn (1988) Dunn DeBello Brennan Murrain (1981) Dunn Dunn (1978) Hamilton (1983) Hart (1983) Hodges (1982) (1985) (1987) Kroon (1985) LaShell (1986) Lynch (1981) Perrin (1984) Sudzina (1987) Wedlund (1987) Wheeler (1980)			the cerebrum "downshifts" during anxiety ** when learning styles have been matched to appropriate instructional approaches, teachers have reported sharp decreases in stress **Strategies for basing instruction on learning styles:** ** identify & match learning style strengths ** share learning style information with students ** deemphasize skill work requirinig strongly analytic learning style ** use a variety of methods in reading ** involve the tactile & kinesthetic modalities of the learner & include many visuals ** provide appropriate amounts of structure ** allow students to work based on sociological preferences ** establish quiet working areas ** create at least one special work area in a classroom ** experiment with scheduling the most difficult subjects during late morning/early noon hour
8.D			
Rhodes (1988)	**Hopi, Navajo students**	*** Holistic Teaching/Learning**	** The thought processes required & encouraged for survival on the reservation are quite different from those required and encouraged for survival in institutions of higher education **** Native American learning styles emphasize**

			** the process of story-telling rather than emphasis on major points or chronology; the "whole picture" is stressed ** use of the presentational or group argumentative process, a circular or spiral process rather than a linear one ** holistic observational techniques over categorization techniques ** consensus in decision making ** responsibility for children at an early age
Becktell (1986)	Navajo learners	* learning process	** the Navajo learning process is composed of 4 components: (1) observe, (2) think, (3) understand/feel, (4) act vs. the Anglo: (1) act, (2) observe/think/clarify, (3) understand
McCartin Schill (1977) Bass Burger (1967-68) Havighurst (1957) Dennis (1943)	American Indian students	* testing	** though scores of American Indian students tend to fall off in higher grades on achievement tests, they continue to score well on non-verbal tests
Wallis (1984)	Indian students	* holistic teaching/ learning	** requires holistic approach to educate Indian students
Werner Begishe (1986)	Navajo learners	* learning process	** Anglos learn through trial & error; Navajos learn before they try & expect trial & success

1 Note: In entries for which subjects are not identified, multiple groups were involved.

2 Note: More's use of "Native Indians" typically refers to Canadian Indians although he uses the term interchangeably with "American Indians."
3 Note: Names of ethnic and tribal groups have been categorized according to the original researcher's/writer's terms and spellings.

APPENDIX B

ALPHABETICAL LISTING OF AUTHORS/RESEARCHERS CODED TO CATEGORIZATION

AUTHORS/RESEARCHERS

Abelson	1.A
Acland	4.E
Akbar	1.A
Albas, C. A.	5.F
Albas, D. C.	5.F
Allen	5.A
Allport	8.A
Amodeo	6.B
Anderson	8.B
Anhelm	5.F
Annis	5.F
Au	7.E
Backman	8.B
Baker	5.G
Baldwin	8.A
Bane	4.E
Banks	8.B
Bass	8.D
Battle	8.B
Bayard	2.B
Beattie	2.F
Beaulieu	5.F
Becktell	8.D
Begishe	8.D
Berry	7.C
Black	1.A
Boggs	7.E
Bounds	3.A
Bowd	7.C
Boykin	1.A
Bradley	4.B, 5.G
Bradshaw	7.C
Brazelton	A.1
Brennan	8.C
Brown	6.B, 8.A
Bruner	8.A
Bryant	7.C
Burnes	8.B
Burger	8.D
Buriel	5.F
Butterfield	1.A
Cantor	5.G
Carbo	8.C
Cardell	4.B
Cattey	0.A, 5.F
Cazden	7.E
Cheek	4.A
Chilcott	5.B
Chrisjohn	7.C
Clark	8.B

Closs	5.G
Cohen, D.	4.E
Cohen, R. A.	1.A, 8.A, 8.B
Cole, E. G.	8.B
Cole, M.	5.F, 6.A
Coleman	7.D
Cooper	8.A
Cox	5.F, 7.C
Cross	4.B
Cullanine	7.C
D'Amato	7.E
Das	7.C
Dasen	5.F
Davidman	7.C
Davis, T.	7.C
Davison	5.G
De Bello	8.C
Della Valle	8.C
Dennis	5.F, 8.D
Deregowski	8.A
Dixon	1.A
Dunn, K.	8.C
Dunn, R.	8.C
Echohawk	2.F
Elliott	3.A
Erickson	7.C
Esen	1.A
Estrada	6.B
Fifer	8.B
Foster	5.F
Foreman	7.A
Freark	2.A
Frost	5.F
Gagne	8.A
Gallimore	7.E
Garner	8.B
Gay	5.F, 5.G, 6.A
Geisart	8.C
Gephart	8.A
Gibson	7.D
Gill	5.D
Gingerich	0.B
Gitter	1.A
Glick	5.F, 6.A
Goldman	1.A
Goodenough	5.F, 7.C, 8.B
Granzberg	5.F
Green	4.B
Greenbaum, F.	7.C
Greenbaum, S.	7.C
Gridley	5.D
Gue	7.C

Gurin, G.	2.F
Gurin, P.	2.F
Guthrie	4.E
Hale	1.A, 6.A
Hall	4.E
Halpin	0.C, 5.F
Hamilton	8.C
Hart	8.C
Havighurst	6.A, 8.D
Henderson	4.E, 5.F
Henry	7.C
Hilliard	1.A
Hodges	8.C
Holsinger	2.F
Holt	1.A
Hunt, J.	1.A
Hunt, L.	5.F
Hynd	5.F
Jarmen	7.C
Jencks	4.E
Jessor, R.	2.F
Jessor, S. L.	2.F
John	0.A, 7.C, 7.E
Jones	2.F
Jordan, C.	7.E
Kagan	5.F, 8.A
Kamii	8.B
Kanungo	7.C
Karlebach	7.C
Kaufman, A. S.	7.C
Kaufman, N. L.	7.C
Kaulbach	7.C
Keefe	5.C
Killbride	8.A
Kirby	7.C
Klein	7.E
Kleinfeld	5.F, 7.C
Knight	2.B
Kroon	8.C
Krywaniuk	7.C
Kuhlberg	2.F
LaBelle	6.B
Languis	5.C
Lao	2.F
LaShell	8.C
Laylin	5.G
LeBrasseur	2.A
Leap	5.G
Lee, C.	8.B
Lee, M. W.	6.A
Lefcourt	2.F
Lesser	6.A, 8.B

Lester	1.A
Letteri	5.C
Lewis	0.B
Light	5.D
Llewellyn	5.D
Loflin	4.C
Lourie	1.A
Lutz	4.B
Lynch	8.C
Madsen	5.F, 8.A
Mahan	4.D, 4.E
Manos	7.C
Marans	1.A
Marashio	2.C
Martin, J. C.	5.F
Martin, R. E.	5.D
Matthews	8.A
Matute-Bianchi	7.D
Mbiti	8.A
McArthur	5.F, 7.C
McCartin	8.D
McClintock, C.	2.B
McClintock, E.	2.B
McCluskey	5.F
McDermott	8.A
McNeil, K.	8.A
McNeil, L.	7.B
McNett	5.G
Messer	7.C
Messick	8.A
Mohatt	7.C
Moore, C. A.	5.F, 7.C
Moore, C. G.	4.B, 5.G
Moore, E.	8.B
More	7.C
Morgan	1.A
Mostofsky	1.A
Munro	2.F
Murrain	8.C
Nettleton	7.C
Newmeyer	1.A
Norton	5.F
Odell	5.F
Ogbu	4.E, 5.E, 7.D
Opler	5.D
Orasanu	8.B
Osborne	5.F
Parsons	2.F
Pea	6.A
Pepper	7.C
Perney	8.B
Perrin	8.C

Peters	7.C
Pettigrew	8.A
Philips	7.C, 7.E
Phillips	8.A
Piestrup	1.A
Posen	2.F
Price-Williams	8.A
Pyatowsky	7.C
Radin	8.B
Ramirez	8.A, 8.B
Renker	5.G
Renzulli	7.C
Reynolds	2.F
Rhodes	8.D
Ribal	2.B
Richardson	8.B
Robbins	8.A
Ross	2.D, 7.A, 7.C
Rotter	8.B
Rychlak	8.B
Ryckman	2.F
Sampson	5.F
Sandefur	8.A
Sanders	1.A
Sapp	3.A
Sawyer	2.B
Scallon, R.	2.E, 7.C
Scallon, S.	2.E, 7.C
Schill	8.D
Schindler	5.G
Schneider	2.F
Scott, P. B.	4.A
Scott, S.	0.A, 5.F
Scribner	5.F, 8.B
Seitz	1.A
Serpell	5.F, 8.A
Shannon	5.F
Shapiro	8.B
Sharp	5.F, 6.A
Sheingold	6.A
Siegel	8.B
Silberman	1.A
Sinatra	8.C
Slade	7.D
Smith, L.	4.B, 5.G
Smith, L. H.	7.C
Smith, M.	4.E
Staub	2.B
Steinberg	5.F
Stodolsky	6.A
Suarez-Orozco	7.D
Sudzina	8.C

Swanson	5.F
Tafoya	2.e, 5.F, 7.C
Terrell, D.	5.D
Terrell, J. E.	5.D
Tharp	7.E
Trimble	2.F
Trotman	8.B
Tyler	2.F
Uzgiris	1.A
Valdivieso	6.C
Valverde	7.D
Vernon	7.C
Vogt	7.E
Vygotski	8.A
Wachs	1.A
Wallis	8.D
Webb	6.A
Wedlund	8.C
Weed	0.A, 5.F
Weitz	7.C
Werner	8.D
Wheeler	8.C
Whiddon	0.C, 5.F
White	7.E
Williams	7.C
Wilson	8.A
Witkin	5.F, 7.C, 8.A, 8.B
Wober	8.A
Woolard	7.D
Young	1.A
Zenhausern	8.C
Zigler	1.A
Zoppel	2.F

APPENDIX C
TAXONOMY OF LEARNING STYLE ASPECTS AND LEARNER ORIENTATIONS

TAXONOMY

ASPECT	**LEARNER ORIENTATIONS**
abstraction/ operational level	* metaphoric ability . . . lack of creative conceptualization * abstract . . . concrete

FINDINGS:

* Native Americans are more right dominant hemispheric thinking (related to creative abilities).
* Native Americans may benefit from both operative and psychometric intelligence investigations.
* A higher frequency and relative strength was found among Indian students in using imagery for coding and understanding.
* Non-Western populations often use imagery as a dominant way of thinking, writing, conceptualizing, and speaking; think in descriptive abstractions; and emphasize extensive expression of concrete emotional words and metaphors.

SOURCES: Anderson, 1988; Dregoski & Serpell, 1974; John, 1972; More, 1987; Osborne, 1985; Sampson, 1981.

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ASPECT	**LEARNER ORIENTATIONS**
coding	* imagery . . . verbal/semantics * abstract . . . concrete

FINDINGS:

* Navajo children excel in spelling (visual), while Anglos excel in vocabulary (verbal).
* Indian children learn more rapidly through imitation and direct visual and tactile experiences than through verbal processes.
* Native Indians evidence a higher frequency and relative strength in global processing on both verbal and nonverbal tasks, and in using imagery for coding and understanding.
* Native students tend to use imagery coding (both abstract and concrete) while non-Native students use verbal coding (labels or definitions).
* Both the Chinese and the Navajo cultures employ right- hemispherically oriented myths, metaphors, symbols and allegories.
* Non-Western populations use imagery as a dominant way of thinking, writing, conceptualizing and speaking.
* Non-Western populations think in descriptive abstractions.

SOURCES: Anderson, 1988; Bryant, 1986; Cattey, 1980; Coombs, 1958; Coombs & Coleman; Greenbaum & Greenbaum, 1983; Havighurst, 1957; John, 1972; Karlebach, 1986; More, 1984, 1987; Tafoya, 1982.

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ASPECT	**LEARNER ORIENTATIONS**
communication	* verbal . . . non-verbal * oral . . . aural * orality literacy . . . essayist literacy

FINDINGS:

* The Afro-American child uses language requiring a wide use of many coined interjections; uses considerable body language; relies on words that depend upon context for meaning; prefers using expressions that have several connotations; adopts a systematic use of nuances of intonation and body language such as eye movement and positioning; prefers oral-aural modalities for learning communication; and is highly sensitive to others' nonverbal cues.
* Black children were found to be more feeling oriented, people oriented, and more proficient at nonverbal communication than White children.
* Black culture emphasizes the nonverbal; experience counts, not what is said.
* Black culture develops proficiency in nonverbal communication.
* Factors which creat good rapport in teacher-Black student interaction include: warmth, verbal interplay during instruction, rhythmic style of speech and distinctive intonation in speech patterns.
* Stylistic dimensions of the oral tradition in Black culture include call and response, rhythmic patterns, spontaneity and concreteness.
* Athabaskan Indian children demonstrate orality literacy rather than essayist literacy.
* Traditional Indian communities have highly sophisticated forms of nonverbal communication.
* Native North Americans may identify emotions from vocalizations by members of their own culture far more accurately than those by members of other cultures; may perceive nonverbal behaviors of teachers differently because of cultural identity; may develop a broad cluster of spatial-field-independence abilities and a distinctive cluster of abilities involving inductive reasoning from nonverbal stimuli because of ecology and child-rearing practices; and evidence a higher frequency and relative strength in global processing on both verbal and nonverbal tasks.
* Non-Western populations do best on verbal tasks and often find their communication styles are in variance with the Western communication styles.
* Concrete/abstract differences may be more an indication that culturally irrelevant ideas become more relevant when presented concretely.
* The Native American system of legends is the best example of imagery coding.
* The Navajo custom of reticence on a first encounter with an unfamiliar person or situation creates difficulties on the very first day of school.

SOURCES: Abkar, 1975; Albas, McCluskey, Albas, 1976; Anderson, 1988; Berry, 1980; Bradley, 1984; Cohen, 1969; Cooper, 1980; Erickson & Mohatt, 1982; Gibson, 1983; Gitter, Black & Mostofsky, 1972; Hale, 1981; Hilliard, 1976; Kleinfeld, 1972; Lester, 1969; Matute-Bianchi, 1986; More, 1987; Newmeyer, 1970; Ogbu, 1974, 1977, 1982a, 1982b, 1983, 1986, 1987; Osborne, 1985; Philips, 1972; Piestrup, 1973; Scallon & Scallon, 1979a, 1983; Silberman, 1970; Smith & Renzulli, 1984; Suarez-Orozco, 1986; Tafoya, 1982; Vygotski, 1978; Young, 1970.

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ASPECT **LEARNER ORIENTATIONS**

discipline
* misbehavior punished . . . misbehavior ignored
* stringent/structured . . . learn from national consequences

FINDINGS:

* Navajo students rebel against the stringent discipline of high schools and choose not to study the most disciplined, visible Western forms of education.
* Threats of physical punishment and force are unacceptable and ineffective methods of behavioral control in Navajo culture while teasing or shaming are common.
* In traditional American Indian cultures, obedience is approached through explanations for desired behavior, the grandparent serves as main disciplinarian, and there is rigorous training to teach moral standards and develop character.
* Culturally specific management routines compatible with Navajo culture are more effective: ignoring misbehavior or lowering one's eyes, indirectly referring to the misdeed while praising honorable behavior standards.

SOURCES: Bradley, 1984; Green, 1977; Guthrie & Hall, 1981; Jencks, Smith, Acland, Bane, Cohen, Gintis, Heyns, Michelson, 1972; Light & Martin, 1985; Mahan & Henderson, 1984; Ogbu, 1978; Opler, 1946; Vogt, Jordan & Tharp, 1987.

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ASPECT **LEARNER ORIENTATIONS**

evaluation
* teacher controlled . . . student initiated
* teacher test . . . self test

FINDINGS:

* Traditional American Indian learning focuses on process over product, legends and stories as traditional teaching paradigms, knowledge obtained from the self, and cognitive development through problem-solving techniques.
* Native American people evidence reflective more than impulsive processing (watch-then-do vs. trial-and-error).
* Though scores of American Indian students tend to fall off in higher grades on achievement tests, they continue to score well on nonverbal tests.

SOURCES: Bass & Burger, 1967-68; Dennis, 1943; Havighurst, 1957; McCartin & Schill, 1977; More, 1987; Rhodes, 1988; Scallon & Scallon, 1983; Tafoya, 1982.

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ASPECT **LEARNER ORIENTATIONS**

family relationship/ interaction
* interdependence . . . independence
* extended . . . nuclear

FINDINGS:

* An important determinant of education attainment is family background.
* Family size and ordinal position of the child may interact with other factors in influencing prosocial behavior.
* The larger size of the Mexican-American family, strength of familial interdependence, and patterning of relationships are reported as

reasons for their relatively greater preference for cooperative or prosocial outcomes in interdependent situations.

* Larger family size is associated positively with generosity.
* Traditional American Indian child-rearing practices focus on children observing from subordinate positions.
* Navajo children are given tremendous responsibility at a very young age. Navajo girls, as members of a matrilineal culture, have prestige and influence over what happens in the home and are often owners of livestock and materials.
* American Indians attach a high degree of importance to childhood as the time for beliefs, values, and attitudes instruction.
* Native North American Indians may develop a broad cluster of spatial-field-independence abilities and a distinctive cluster of abilities involving inductive reasoning from nonverbal stimuli because of ecology and child-rearing practices.
* The pattern of multiple caretakers and companion groups in Native Hawaiian natal culture manifests itself in high rates of peer interaction, frequent scanning for other children's errors, and offering and soliciting peer help.
* Separation of sexes in traditional Navajo families clearly defines cultural roles.
* Styles of thinking are produced by the kinds of families and groups into which students are socialized--Black children adopted by White families were found to score higher.
* When compared with Caucasian and Black babies, Chinese babies are more amenable and adaptable in situations where other babies register annoyance and complaint.
* Zambian mothers' high contact, loving environment for their babies provides more handling and feeding contact, thereby producing more stimulation, alertness, social interest, and consolability in their children.
* In the Nigerian culture, children grow up in a social network characterized by physical closeness, acceptance, and care.

SOURCES: Banks, 1988; Brazelton, Young & Bullowa, 1971; Cattey, 1980; Cohen, 1969; Esen, 1973; Freedman, 1979; Gallimore, Boggs & Jordan, 1974; Gill, 1982; Guthrie & Hall, 1981; Hale, 1981; Halpin, Halpin & Whiddon, 1980; Jencks, Smith, Acland, Bane, Cohen, Gintis, Heyns, Michelson, 1972; Jordan, 1977, 1984; Jordan, Tharp & Vogt, 1985; Knight & Kagan, 1982; Light & Martin, 1985; McClintock, Bayard & McClintock, 1979; Mahan & Henderson, 1984; Moore, 1985; More, 1987; Ogbu, 1978; Osborne, 1985; Ribal, 1963; Sawyer, 1966; Scallon & Scallon, 1979b, 1983; Staub, 1970, 1971a, 1971b; Tafoya, 1982; Valdivieso, 1986; Vogt, Jordan & Tharp, 1987.

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* Significant field dependence differences exist between Black and White students and between males and females; Black females evidence the most field-dependence.
* Native North American Indians may develop a broad cluster of spatial-field-independence abilities and a distinctive cluster of abilities involving inductive reasoning from nonverbal stimuli because of ecology and child-rearing practices.
* Native American people evidence a higher frequency and relative strength in global processing on both verbal and nonverbal tasks.
* Native North American Indians evidence a relative strength in simultaneous processing, but a possibility that sequential processing abilities develop much slower than simultaneous skills because they are not used in the primary grades.
* A field dependent person is less able to separate a part from the whole, but is more conscious of other people and therefore often socially intuitive.

SOURCES: Anderson, 1988; Banks, 1988; Cohen, 1969; Cullanine, 1985; Garner & Cole, 1986; Hale, 1981; Hilliard, 1976; Kagan & Buriel, 1977; MacArthur, 1968; Messick, 1970; More, 1984, 1987; Osborne, 1985; Perney, 1976; Ramirez, 1973; Ramirez & Castaneda, 1976; Ramirez & Price-Williams, 1974; Weitz, 1971; Witkin, Moore, Goodenough & Cox, 1977; Witkin, 1950, 1962; Witkin & Goodenough, 1981.

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cognitive processing	* integrates without temporal ordering . . . integrates with temporal or serial ordering * spatial events . . . verbal events * memorization ability . . . lack of highly developed memorization ability * approximation . . . accuracy

FINDINGS:

* Afro-American people tend to view things in their entirety and not as isolated parts; to prefer inferential reasoning rather than deductive or inductive reasoning; and to approximate space, number and time instead of aiming for complete accuracy.
* Navajo students speak a language that does not have a word for multiply, divide, if, cosine or sine, nor do students have the beliefs associated with them.
* Navajo students find it difficult to accept (1) equations as equal if the member parts are not identical and (2) problems in which a hypothetical situation is expressed.
* Navajo students learn more effectively through culture-based mathematics though main-stream mathematics cannot be pushed aside; very little research has been done relating the indigenous mathematics of Native Americans to school mathematics.
* In traditional Indian cultures, children are required to develop excellent memory skills, skills which may be a barrier in higher mathematics.
* American Indians' holistic nature of thought characterizes a preference for working with the whole before attempting analysis of parts or sections (linear).
* Black, Chinese, Jewish, and Puerto Rican students are markedly different in both the level of each mental ability and the pattern among those abilities.
* Black students, lower-class and middle-class children differ in their ability to group pictures, not objects; lower-class children form groups based on interdependence of items; middle-class children formed grouped on basis of common physical attributes.
* White children sort taxonomically more often than do Black children who show preference for functional sorting; although they show differences in organizational preferences, they show no differences in recall.
* Indian students use simultaneous processing more frequently and effectively than non-Indian students, particularly non-assimilated Indian students.
* For students whose internal cognitive processing emphasizes the global or holistic, whole language and sight-word vocabulary building are more effective than the more traditional phonics and sounding-out-words approaches.

SOURCES: Banks, 1988; Bradley, 1984; Cazden & John, 1971; Cohen, 1969; Das, Kirby & Jarman, 1979, 1982; Gardner, 1959; Hale, 1981; Hilliard, 1976; John, 1972; Kagan, 1966; Kaufman & Kaufman, 1983; Kirby, 1984; Krywaniuk, 1974; Lesser, Fifer & Clark, 1965, 1967; Moore, 1982; More, 1984, 1987; Orasanu, Lee & Scribner, 1979; Philips, 1972; Siegel, Anderson & Shapiro, 1966; Smith, 1981; Swisher & Deyhle, 1987; Vogt, Jordan & Tharp, 1987; White, Tharp, Jordan & Vogt, 1988.

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SOURCES: Anderson, 1988; Banks, 1988; Becktell, 1986; Bradley, 1984; Bradshaw & Nettleton, 1981; Brown, 1986; Cheek, 1984; Cooper, 1980; Das, Kirby & Jarman 1979, 1982; Das, Manos & Kanungo, 1975; Davidman, 1981; Gagne & Gephart, 1968; Gallimore, Boggs & Jordan, 1974; Gay & Cole, 1967; Guthrie & Hall, 1981; Jencks, 1972; John, 1972; Jordan, 1977, 1984; Kaufman & Kaufman, 1983; Killbride & Robbins, 1968; Kirby, 1984; Krywaniuk, 1974; Leap, McNett, Cantor, Baker, Laylin & Renker, 1982; Lesser, Fifer & Clark, 1965, 1967; Mahan & Henderson, 1984; Marashio, 1982; Matthews, 1973; McDermott, 1980; Messer, 1976; Moore, 1982; More, 1984, 1987; Norton, 1975; Ogbu, 1974, 1977, 1978, 1982a, 1982b, 1983, 1986, 1987; Osborne, 1985; Pepper & Henry, 1986; Rhodes, 1988; Scallon & Scallon, 1983; Schindler & Davison, 1985; Scott, 1983; Smith, L., 1981; Tafoya, 1982; Vernon, 1969; Vogt, Jordan & Tharp, 1987; Wallis, 1984; Weitz, 1971; Werner & Begishe, 1986; Williams, 1986; Wilson, 1971; Wober, 1967.

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ASPECT	**LEARNER ORIENTATIONS**
locus of control	* internal . . . external

FINDINGS:

* Specific parental behaviors across both American Indian and White cultures appear to be antecedents of an internal locus of control and positive self-esteem.
* Ethnic minorities and those from low SES levels score in a more external locus of control direction than Caucasians.
* Differences in locus of control for Black students may disappear with adequate SES controls.
* Measuring locus of control for Black youth requires distinguishing how much control one believes most people in society possess (ideological control) and how much control one believes one personally possesses (personal control).
* Native North American cultures may define self-control differently than other cultures.
* The Chinese have a traditional style of learning that emphasizes external forms and rote memorization.
* Both field dependence and locus of control are related to academic achievement with field dependence being more important.
* Locus of control is related primarily to social class rather than race or ethnicity.

SOURCES: Banks, 1988; Battle & Rotter, 1963; Echohawk & Parsons, 1972; Garner & Cole, 1986; Gurin, Gurin, Lao & Beattie, 1969; Halpin, Halpin & Whiddon, 1980; Jessor, Graves, Hanson & Jessor, 1968; Jones & Zoppel, 1979; Lefcourt, 1966; Munro, 1979; Ogbu, 1974, 1977, 1982a, 1982b, 1983, 1986, 1987; Osborne, 1985; Parsons & Schneider, 1974; Reynolds, 1976; Ryckman, Posen & Kulberg, 1978; Trimble, 1981; Trimble & Richardson, 1982; Tyler & Holsinger, 1975.

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ASPECT	LEARNER ORIENTATIONS
perception channel/ sensory mode/ external conditions	* auditory * verbal * tactile * visual * spatial * kinesthetic

FINDINGS:

* Navajo youngsters manifest greater sensitivity to geometric designs than White children of the same age and excel at tasks requiring fine visual discrimination.
* Indian pre-school children evidence fine motor coordination.
* Northern Canadian Indians and Inuits evidence a higher frequency and relative strength in processing visual/spatial information.
* Indian and Inuit children are most successful at processing visual information and have the most difficulty performing well on verbal content tasks. Kaulback cautioned that these findings did not imply a deficit in the ability to conceptualize through language.
* Navajo Indian children learn more rapidly through imitation and direct visual and tactile experiences than through verbal processes.
* American Indian children learn more rapidly through imitation and direct visual and tactile experiences than through verbal processes.
* American Indian children of the Southwest are visual in approaches to the world.
* The visual acuity differences of Native North Americans may be tuned by the early visual environment; the carpentered nature of urban surroundings may result in greater awareness of horizontal and vertical lines among urban dwellers as opposed to people who live in non-carpentered environments.

SOURCES: Anhelm, 1974; Annis & Frost, 1973; Bowd, 1971; Cattey, 1980; Colliers, 1967; Coombs, 1958; Feldman & Dittman, 1970; Havighurst, 1957; John, 1972; Kaulbach, 1984; Kleinfeld, 1973, 1975, 1979; Kuipers; More, 1987; Osborne, 1985; Vernon, 1969.

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ASPECT	LEARNER ORIENTATIONS
reflective/ impulsive processing	* watch/listen-then-do . . . trial-and-error

FINDINGS:

* Yaqui culture expects children to learn by watching and modelling; a task should not be attempted until it can be performed well. The cultural learning style conflicts with the school learning style when students are given credit for trying and then forced to attempt the task before ridiculing peers.
* Rather than "explain-read-do-recite" approaches to learning, Navajos prefer learning through extensive observation and imitation, along with the assurance of success, learning through reflective more than impulsive processing.

* The Navajo learning process is composed of 4 components: (1) observe, (2) think, (3) understand/feel, (4) act vs. the Anglo: (1) act, (2) observe/think/clarify, (3) understand.
* Anglos learn through trial and error; Navajos learn before they try and expect trial and success.

SOURCES: Appleton, 1983; Becktell, 1986; Mahan & Henderson, 1984; More, 1984, 1987; Swisher & Deyhle, 1987; Rhodes, 1988; Wax, Wax & Dumon, 1964; Werner & Begishe, 1986.

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ASPECT	**LEARNER ORIENTATIONS**
social - interaction/ motivation	* competitive . . . cooperative * aggressive . . . passive * interpersonal . . . intrapersonal * antisocial . . . prosocial * respect for elders . . . elders as equals

FINDINGS:
* Navajo and Chinese cultures stress harmony and unity--a basic "oneness."
* Navajo mothers use their eyes rather than their voice to attract the baby's attention; the babies show greater passivity than Anglo babies.
* Chinese babies are more amenable and adaptable in situations where other babies register annoyance and complaint.
* Zambian mother's high contact, loving environment for their babies provide more handling and feeding contact and produce more stimulation, alertness, social interest and consolability in their children.
* In Nigerian culture, children grow up in a social network characterized by physical closeness, acceptance and care.
* Black children are more feeling oriented, people oriented and more proficient at nonverbal communication than White children.
* Many different American Indian tribes have the following values that may influence school performance: avoidance of competition, high value on cooperation, strong peer influence.
* Black and White urban college students demonstrate participative and collaborative learning styles more than avoidant, competitive, dependent or independent.
* In Navajo culture, cooperation is stressed over competition.
* Navajo students may avoid eye contact with a teacher as a sign of respect for an elder. The same is true in many Hispanic cultures.
* Navajo children are given tremendous responsibility at a very young age; Navajo girls, as members of a matrilineal culture, have prestige and influence over what happens in the home and are often owners of livestock and materials.
* For Navajo students, praise may not be reinforcing.
* Cheyenne Indian children are to have parents' full attention, subsequently learning to respect elders; chastisement of children is abhorred.
* Cheyenne Indian children are encouraged to play in such ways that train them for adult responsibilities.
* Mexican students' interactions with their teachers tend to be formal.
* Mexican culture stresses that students are to respect authority; emphasize cooperation.

* Traditional American Indian learning focuses on process over product, legends and stories as traditional teaching paradigms, knowledge obtained for the self, and cognitive development through problem-solving techniques.
* White Canadians and Cree Indians develop high self-esteem in school through praise of grades and parental pleasure at their effort.
* Hawaiian teaching-learning interactions are characterized by voluntary participation; traditional school-culture script is "one person at a time."
* For both Native Hawaiian and Navajo children, indirect praise and praise to a group are more effective than direct praise of one child.
* A higher level of intellectual home environment exists for middle-class Whites than for middle-class Blacks; cultural differences exist in home experiences and parent-child interactions in Black and White families of the same social class.
* Practices of lower-lower and middle-class Black mothers differ significantly--social class is not a determinant of behavior but a statement of probability that a type of behavior is likely to occur.
* Mexican-American children tend to be field sensitive (like to work with others to achieve a common good) and are sensitive to the feelings and opinions of others; teachers prefer field-independent students and assign them higher grades, though cognitive style is not related to measured intelligence or IQ.
* Styles of thinking are produced by the kinds of families and groups into which students are socialized.

SOURCES:
Abkar, 1975; Albas, McCluskey & Albas, 1976; Amodeo & Brown, 1986; Anderson, 1988; Au, 1980; Au & Jordan, 1981; Banks, 1988; Boykin, 1978; Brazelton, Young & Bullowa, 1971; Brown, 1980; Callaghan; Cattey, 1980; Cazden, 1982; Cohen, 1969; D'Amato, 1986; Dumont, 1972; Erickson & Mohatt, 1982; Esen, 1973; Estrada & LaBelle, 1979; Freedman, 1979; Gitter, Black & Mostofsky, 1972; Goldman & Sanders, 1969; Guthrie & Hall, 1981; Hale, 1981; Jencks, Smith, Acland, Bane, Cohen, Gintis, Heyns, Michelson, 1972; Kagan & Madsen, 1971; Kamii & Radin, 1967; Knight & Kagan, 1982; LeBrasseur & Freark, 1982; Light & Martin, 1985; Llewellyn & Hoebel, 1967; Mahan & Henderson, 1984; Marans & Lourie, 1967; Miller & Thomas, 1972; Morgan, 1976; Ogbu, 1978; Osborne, 1985; Philips, 1972; Piestrup, 1973; Ramirez & Castaneda, 1974; Ramirez & Price-Williams, 1974; Sapp, Elliott & Bounds, 1983; Silberman, 1970; Swisher & Deyhle, 1987; Tafoya, 1982; Trotman, 1977; Wachs, Uzgiris & Hunt, 1971; Van Ness, 1981; Vogt, Jordan & Tharp, 1987; Wober, 1967; Wolcott, 1967; Young, 1970

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ASPECT	**LEARNER ORIENTATIONS**
visual discrimination/ attention	* visual acuity . . . lack of acuity

FINDINGS:
* Navajo children excel at tasks requiring fine visual discrimination.
* Navajo mothers use their eyes rather than their voice to attract their baby's attention.

* Navajo children are visual in their approach to the world.
* Particularly the Navajo, as well as the Chinese, are likely to be better in visual discrimination skills.
* Visual acuity differences may be tuned by the early visual environment; the carpentered nature of urban surroundings may result in greater awareness of horizontal and vertical lines among urban dwellers as opposed to people who live in non-carpentered environments.
* Blacks and Native North Americans perceive elements as a part of a total picture.
* Native North American may prefer contrast over Anglo preferences of angularity, linearity, and curvilinearity.

SOURCES:
Anderson, 1988; Anhelm, 1974; Annis & Frost, 1973; Callaghan, 1969; Cattey, 1980; Colliers, 1967; Dasen, 1975; John, 1972; Killbride & Robbins, 1968; Kleinfeld, 1973, 1975, 1979; Osborne, 1985; Swanson & Henderson, 1979.

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ASPECT	**LEARNER ORIENTATIONS**
world orientations	* global . . . analytic * present . . . future * analytic . . . relational * obverse to learn . . . participate to learn * culture-based content . . . mainstreamed content * culture sensitive . . . culture insensitive

FINDINGS:
* The non-Western heritage of Afro-Americans suggests knowledge stems from the proposition that, "I feel, therefore, I think, therefore, I am" vs. "I think, therefore, I am."
* Afro-American people tend to view things in their entirety and not as isolated parts.
* Schools do not support the natural energy level of Black children who need an active environment for successful learning; Black children elicit more punishment and are labeled hyperactive more frequently because of their high motoric activity.
* White children are object oriented and have numerous opportunities to manipulate objects and discover properties and relationships; Black children are more people oriented; the affective orientation is linked to the greater continuity in the behavior of Black mothers.
* A utilitarian education is commonly taught in Euro-American schools.
* American Indian children often observe from subordinate positions.
* The Yaqui world-view is not accommodated by modern industrial society and its system of education.
* American Indian children are taught to respect life.
* Hopi Indians have strengths which are not tapped by tests traditionally used by Western societies.
* Hopi Indians may develop compensatory skills because of rigors of survival in traditional environments.
* Traditional American Indian students do not become more future-oriented with age, as do Anglo students.

* Native people evidence a higher frequency and relative strength in global processing on both verbal and non-verbal tasks.
* Non-Western populations often differ in world views and cosmic orientations; value harmony with nature; view religion as inseparable from culture rather than as a distinct part; accept the world view of other cultures without expressing the superiority of their own; perceive elements as a part of a total picture; often find their communication styles are in variance with the Western communication styles; think in descriptive abstractions; perceive thought as holistic; and learn better from materials which have a human/social content and which are characterized by fantasy and humor.
* The Navajo learning process is composed of 4 components: (1) observe, (2) think, (3) understand/feel, (4) act vs. the Anglo: (1) act, (2) observe/think/clarify, (3) understand.
* Navajo cultural and religious taboos may be ignored by certain literature selections and art activities.

SOURCES:

Allport & Pettigrew, 1957; Anderson, 1988; Baldwin, 1980; Becktell, 1986; Bradley, 1984; Bradshaw & Nettleton, 1981; Bruner, 1966; Chilcott, 1985; Cohen, 1969, 1971; Cole, Gay, Glick & Sharp, 1971; Crowell, 1977; Davis & Pyatowski, 1976; Dennis, 1943; Dixon & Foster, 1971; Gallimore, Boggs & Jordan, 1974; Gay & Cole, 1967; Gridley, 1974; Gue, 1971; Guthrie & Hall, 1981; Hale, 1981; Havighurst, 1976; Hilliard, 1976; Jencks, Smith, Acland, Bane, Cohen, Gintis, Heyns, Michelson, 1972; Keefe, 1985; Keefe & Languis, 1983; Klein, 1981; Kleinfeld, 1973, 1975, 1979; Lee, 1986; Light & Martin, 1985; Mahan & Henderson, 1984; Marashio, 1982; Masden, 1982; Matthews, 1973; Mbiti, 1970; Moore, 1982; More, 1984, 1987; Morgan, 1976; Ogbu, 1978; Osborne, 1985; Rhodes, 1988; Scallon & Scallon, 1979b; Schindler & Davidson, 1985; Shannon, 1975, 1976; Smith, 1981; Tafoya, 1982; Vogt, Jordan & Tharp, 1987; Webb, 1983; Witkin, 1967; Young, 1970.